CHAPTER 7 - GRADING AND EROSION CONTROL STANDARDS

1. SOILS REPORTS

A preliminary soils report is required with the submittal of all grading plans. The City Engineer may waive the requirement for the preliminary report for grading projects which have cut or fill with a height of five feet or less or where it can be shown that the preliminary report is not needed to ensure the protection of the health, safety or welfare of the public. All soil reports shall be bound within sturdy covers and signed and sealed by a registered engineer competent in the field of soils engineering. The report shall be neat and logically ordered and include an index, the City project ID, name and location of the project, the name, address and telephone number of the firm which prepared the report and the date of the report. Each page of the report shall be numbered..

The preliminary soils report must be current and must reference the specific project proposed for development. Reports over one year old at time of grading plan submittal and/or reports which reference a different grading proposal must be made current by submittal of an amended report or by submittal of a signed and sealed letter from the soils engineer stating that the findings and conclusions of the previous report are current and valid for the present proposed project.

The preliminary soils report shall at a minimum include the following:

A. A written description of the proposed project or grading work to be done and a preliminary site plan;

B. A location map and geologic history of the site and surrounding region including a synopsis of the existing soils condition, description of the type and extent of the existing vegetation, description of the seismic setting and proximity of nearby faults, and presence of water on the site;

C. A description of the testing done onsite including number and location of the test holes, a map showing the location of the test sites, type and depth of the holes, depth of any found water table, evidence of seismic or landslide activity, reason for performing the test and explanation of the test results;

D. Soil profiles;

E. A description of the laboratory testing done on soil samples including a description of where the samples came from, reason for performing the test, test results and explanation of the test results;

F. Calculations, if any, needed to determine the stability of any slopes which exceed twenty feet in height or which are steeper than two horizontal to one vertical;

G. A summary of the conclusions and recommendations as to the suitability of the site for the proposed project, any building restrictions, any proposed mitigation measures, footing or building foundation recommendations, type and placement of any subsurface drains or any other recommendations as may be determined by the soils engineer;

H. A set of recommended specifications for the grading work to be done on the site.

2. SLOPES

A. No cut or fill slope shall be steeper than two horizontal to one vertical unless specifically approved by the City Engineer. The City Engineer may approve a slope steeper than two to one under the following conditions:

1) The cut or fill at a steeper slope will be stable and not create a hazard to public or private property;

2) The steeper slope is determined by the City Engineer to be necessary to reduce the overall environmental or aesthetic impacts of the grading project;

3) The overall project grading is consistent with the provisions of the Hillside Grading Ordinance;

4) A soils report prepared by a registered engineer qualified in the field of soils engineering is submitted which report shall provide calculations indicating that the proposed slope will have a factor of safety of 1.5 or better for both deep seated and surficial failures under saturated soil conditions.

B. Cut and fill slopes shall be set back from site boundaries in accordance with City of Carlsbad Standard Drawing GS-14.

C. Buildings shall be set back from cut or fill slopes in accordance with City of Carlsbad Standard Drawing GS-15, or as specifically approved by the City Engineer.

D. Terrace drains shall be installed on all manufactured slopes exceeding thirty feet in height. The City Engineer may waive this requirement for slopes with a longitudinal length of one hundred feet or less, or upon the recommendation of a registered soils engineer or geologist that such terrace drain is not necessary for stability or erosion protection. Terrace drains shall be designed to prevent deposition of sand and/or other soil materials within the concrete drain. The minimum longitudinal slope shall be two percent and maximum slope shall be twelve percent. Drainage terraces exceeding eight feet in width need only be paved for a width of eight feet, provided such pavement provides for a minimum channel depth of one foot. Down drains or drainage outlets shall be provided at approximately three hundred foot intervals along the drainage terrace. All such down drains or outlets shall be designed to safely convey the intercepted waters to the point of disposal.

3. SITE DRAINAGE

A. All drainage facilities shall be designed to carry surface waters to the nearest practical street, storm drain, or natural water course approved by the City Engineer. When discharging concentrated flows onto natural ground, the engineer-of-work shall provide appropriate calculations to determine the erosive effects at the point of discharge and immediately downstream from the discharge point. If erosive velocities will occur at the discharge point or immediately downstream, then an appropriately designed rip-rap field or other energy dissipating device shall be installed to mitigate the erosive effects.

B. Graded building pads shall have a minimum slope of one percent towards an adjoining street or an approved drainage course. A lessor slope may be approved by the City Engineer for sites graded in relatively flat terrain, or where special drainage provisions are made. In such cases, the City Engineer may require a supporting recommendation by a registered soils engineer.

C. Berms, swales or other methods and devices shall be provided at the top of cut and fill slopes to prevent surface waters from overflowing onto and damaging the slope face. Special drainage provisions shall be made where a building or structure exists within five feet of the top of a slope.

4. EROSION CONTROL

A. An erosion control plan shall be included as an integral part of all grading plans. The erosion control plan shall be designed to minimize the loss of soil materials from the project site to the maximum extent practicable. Onsite erosion control measures are required for all grading projects regardless of whether or not a proposed or existing sedimentation basin is located downstream from the project site. Engineers are encouraged to use the standard erosion control detail and note sheet available at minimal cost from the Engineering Counter. The erosion control sheet is also available in digital format.

B. All temporary onsite erosion control measures shall be designed to mitigate the erosion impacts of a two year 24-hour storm unless otherwise directed by the City Engineer.

C. Erosion control measures employed on a project site shall include but not be limited to the use of gravel bags, straw and other matting materials, hay bales, siltation fences, sedimentation basins, grassy swales, hydroseeding, straw mulching, check dams or any other measure as may be approved by the City Engineer.

D. For project sites with a graded area of one acre or more, the erosion control plan must also be made to comply with the General Construction Permit requirements of the Regional Water Quality Control Board.

E. All landscaping and irrigation shall be done in accordance with the latest version of the City Landscape Manual.

F. Permanent sedimentation basins shall be designed to capture soils with a particle size of 0.02 mm or greater during a ten year 24-hour storm. The City Engineer may allow the use of 0.074 mm particle size in areas where the discharge of finer soil materials will not adversely affect downstream habitats or land uses. Sedimentation basins shall be adequately designed to retain a minimum five years worth of sediment generated from the contributing hydrologic basin in its fully developed state.

G. Check dams or other erosion control measures shall be installed along all unprotected swales, roads or other drainage courses where the velocity of the drainage runoff exceeds the erosive velocity of the underlying soil material. In the absence of specific soil testing and soil transport calculations which may dictate another design, the distance between check dams shall be as follows:

Slope Gradient	Interval
0 - 4%	100 feet
4 - 10%	50 feet
Over 10%	25 feet

5. STANDARD NOTES

All Grading and Erosion Control Plans shall include the standard grading and erosion control notes and erosion control details as shown on City of Carlsbad Standard Drawing GS22 and GS23.